WHAT IS CLAIMED IS:

1 1. A file-update apparatus which is able to mount a removable

2 first recording medium storing location information showing

3 a storage location, on the first recording medium, of data

4 constituting a content of a file, and which executes a

5 plurality of update procedures to update the file,

6 comprising:

7 a second recording medium;

8 a progress recording unit operable to record, onto the

9 second recording medium, progress information showing which

10 of the update procedures have been executed in updating the

11 file;

12 a new-data recording unit operable to record, onto the

13 first recording medium, data constituting a content of the

14 file after updating, in a different storage location from

15 the data constituting the content of the file before

16 updating;

17 an update information recording unit operable to record,

18 onto the second recording medium, update information showing

19 the storage location, on the first recording medium, of the

20 data constituting the post-update file content; and

21 an updating unit operable, after the update information

22 has been recorded, to update the location information based

23 on the update information, so as to show the storage location

24   of the data constituting the post-update file content.

1   2. The file-update apparatus of claim 1, wherein

2   the progress information includes information for

3   identifying whether the update information has been recorded,

4   and

5   the file-update apparatus further comprises:

6   a re-updating unit operable, if a predetermined

7   condition is satisfied, to judge whether the update

8   information has been recorded, based on the progress

9   information, and when judged in the affirmative, to update

10   the location information based on the update information,

11   so as to show the storage location of the data constituting

12   the post-update file content.

1   3. The file-update apparatus of claim 2, further comprising:

2   an ID recording unit operable, before the updating of

3   the file, to read unique medium identifier information from

4   the first recording medium, and hold the medium identifier

5   information within the file-update apparatus; and

6   a re-update suppressing unit operable to read medium

7   identifier information from a removable recording medium

8   mounted in the file-update apparatus, compare the read medium

9   identifier information with the held medium identifier

10 information, and suppress the updating of the location

11 information by the re-updating unit if the read medium

12 identifier information does not match the held medium

13 identifier information.

1   4. The file-update apparatus of claim 2, wherein

2   the location information shows storage locations of

3   data constituting contents of all files on the first

4   recording medium,

5   the file-update apparatus targets a plurality of the

6   files for updating,

7   the progress recording unit records progress

8   information for each targeted file,

9   the new-data recording unit conducts, for each targeted

10 file, the recording, onto the first recording medium, of data

11 constituting a content of the file after updating,

12   the update information recording unit conducts the

13 recording of update information, for each file that has

14 undergone data recording by the new-data recording unit,

15   the updating unit conducts, for each file for which

16 update information has been recorded, the updating of

17 location information based on the update information of the

18 file, and

19   the re-updating unit, if the predetermined condition

20 is satisfied, conducts the updating of location information

21 for each file, when judged, based on the progress information

22 of the file, that update information relating to the file

23 has been recorded.

1 5. The file-update apparatus of claim 4, further comprising:

2   a close instruction receiving unit operable to receive

3 a close instruction relating to individual files that have

4 undergone data recording by the new-data recording unit,

5 wherein

6   the progress information includes information for

7 identifying whether a close instruction has been received,

8   the updating unit conducts, for each file, the updating

9 of location information, only after update information

10 relating to the file has been recorded and a close instruction

11 relating to the file has been received, and

12   the re-updating unit, if the predetermined condition

13 is satisfied, conducts the updating of location information

14 for each file, only when judged, based on the progress

15 information of the file, that update information relating

16 to the file has been recorded and a close instruction relating

17 to the file has been received.

1 6. The file-update apparatus of claim 4, wherein

2   the first recording medium stores (i) FAT information

3 showing, for each of a plurality of clusters on the first

4 recording medium, whether data constituting any file content

5 is stored in the cluster, and that clusters storing data

6 constituting the content of the same file are linked, and

7 (ii) directory information showing, for each file on the

8 first recording medium, the first cluster storing data

9 constituting the content of the file,

10   the location information is formed from the directory

11 information and all FAT information except for

12 unused-cluster information, which is FAT information showing

13 clusters that do not store data constituting any file

14 content,

15   the update information relating to each file that has

16 undergone data recording by the new-data recording unit is

17 formed from (i) consecutive-relation information showing

18 that clusters storing data constituting the content of the

19 file after updating are linked, and (ii) entry information

20 showing the first cluster storing data constituting the

21 post-update file content,

22   the updating unit, for each file for which update

23 information has been recorded, updates (i) the FAT

24 information based on the consecutive-relation information

25 of the file, so as to show that clusters storing data

26 constituting the content of the file after updating are

27 linked, and (ii) directory information relating to the file

28 based on the entry information of the file, so as to show

29 the first cluster storing data constituting the post-update

30 file content, and

31   the re-updating unit updates the location information

32 by updating the FAT information based on the

33 consecutive-relation information and the directory

34 information based on the entry information.

1 7. The file-update apparatus of claim 6, further comprising:

2   an area-release unit operable, for each file for which

3 update information has been recorded, to record, onto the

4 second recording medium, free-space information showing that

5 clusters which stored data constituting the content of the

6 file before updating do not store data constituting any file

7 content, wherein

8   the updating unit conducts the updating of the FAT

9 information so that the free-space information is reflected

10 in the unused-cluster information, and

11   the re-updating unit conducts the updating of the FAT

12 information so that the free-space information is reflected

13 in the unused-cluster information.

1　8. The file-update apparatus of claim 7, further comprising:

2　　　a FAT-information copying unit operable, before the

3　updating of any of the files, to copy the FAT information

4　on the first recording medium into a working FAT area on the

5　second recording medium, as working FAT information; and

6　　　a close instruction receiving unit operable to receive

7　a close instruction relating to individual files that have

8　undergone data recording by the new-data recording unit,

9　wherein

10　　　the progress information includes information for

11　identifying whether a close instruction has been received,

12　　　the new-data recording unit records data constituting

13　post-update file content into clusters not storing data

14　constituting other post-update file content, based on (i)

15　the working FAT information and (ii) the used-area

16　information or the consecutive-relation information,

17　　　the update information recording unit makes the working

18　FAT information reflect (i) the consecutive-relation

19　information of each file for which a close instruction has

20　been received, and (ii) free-space information that shows

21　clusters which stored data constituting the content of the

22　file before updating do not store data constituting any file

23　content,

24　　　the updating unit updates the FAT information based on

25   the working FAT information, and

26   the re-updating unit, if the predetermined condition

27   is satisfied, (i) makes the working FAT information reflect,

28   for each file, consecutive-relation information and

29   free-space information that relate to the file, when judged,

30   based on the progress information of the file, that a close

31   instruction relating to the file has been received, (ii)

32   updates the FAT information based on the working FAT

33   information, and (iii) updates the directory information

34   based on the entry information of each file whose progress

35   information shows that a close instruction has been received.

1   9. The file-update apparatus of claim 8, further comprising:

2   an update instruction receiving unit operable, at a

3   time of re-updating, to receive an update instruction

4   indicating that if the first recording medium stores data

5   constituting post-update file content, the location

6   information is to be updated so as to show the storage location

7   of the data, wherein

8   the re-updating unit, if the predetermined condition

9   is satisfied and the update instruction has been received,

10 makes the working FAT information, prior to use in updating

11 the FAT information, reflect for each file,

12 consecutive-relation information and free-space information

13 that relate to the file, when judged, based on the progress

14 information of the file, that update information relating

15 to the file has been recorded.

1 10. The file-update apparatus of claim 1, wherein

2 the first recording medium includes an authentication

3 area and a normal area that are mutually independent, a

4 predetermined access restriction applying to only the

5 authentication area of the two areas,

6 the location information is formed from (i) first

7 location information showing storage locations, within the

8 authentication area, of data constituting contents of all

9 files in the authentication area, and (ii) second location

10 information showing storage locations, within the normal

11 area, of data constituting contents of all files in the normal

12 area,

13 the progress information is formed from (i) first

14 progress information showing, for each file in the

15 authentication area, which of the update procedures have been

16 executed in updating the file, and (ii) second progress

17 information showing, for each file in the normal area, which

18 of the update procedures have been executed in updating the

19 file,

20 the new-data recording unit (i) conducts, for each file

21 in the authentication area targeted for updating, the

22 recording, into the authentication area, of data

23 constituting a content of the file after updating, and (ii)

24 conducts, for each file in the normal area targeted for

25 updating, the recording, into the normal area, of data

26 constituting a content of the file after updating,

27   the update information is formed from (i) first update

28 information showing, for each file in the authentication area

29 that has undergone data recording by the new-data recording

30 unit, the storage location, within the authentication area,

31 of data constituting the post-update file content, and (ii)

32 second update information showing, for each file in the

33 normal area that has undergone data recording by the new-data

34 recording unit, the storage location, within the normal area,

35 of data constituting the post-update file content, and

36   the updating unit (i) conducts, for each file in the

37 authentication area for which first update information has

38 been recorded, the updating of first location information

39 based on the first update information of the file, and (ii)

40 conducts, for each file in the normal area for which second

41 update information has been recorded, the updating of second

42 location information based on the second update information

43 of the file.

1   11. The file-update apparatus of claim 1, wherein

2   the first recording medium is a flash memory, and

3   the second recording medium is a memory that is

4   accessible faster than the first recording medium.

1   12. The file-update apparatus of claim 11, wherein

2   the second recording medium is a RAM, and has power

3   supplied by a power source that is independent from a power

4   source of the first recording medium.

1   13. A file-update method that executes a plurality of update

2   procedures to update a file on a first recording medium

3   storing location information showing a storage location, on

4   the first recording medium, of data constituting a content

5   of the file, comprising the steps of:

6   recording, onto a second recording medium, progress

7   information showing which of the update procedures have been

8   executed in updating the file;

9   recording, onto the first recording medium, data

10 constituting a content of the file after updating, in a

11 different storage location from the data constituting the

12 content of the file before updating;

13   recording, onto the second recording medium, update

14 information showing the storage location, on the first

15 recording medium, of the data constituting the post-update

16 file content; and

17   updating, after the update information has been

18 recorded, the location information based on the update

19 information, so as to show the storage location of the data

20 constituting the post-update file content.

1   14. The file-update method of claim 13, wherein

2   the progress information includes information for

3   identifying whether the update information has been recorded,

4   and

5   the file-update method further comprises the step of:

6   judging, if a predetermined condition is satisfied,

7   whether the update information has been recorded, based on

8   the progress information, and when judged in the affirmative,

9   updating the location information based on the update

10 information, so as to show the storage location, on the first

11 recording medium, of the data constituting the post-update

12 file content.

1   15. A computer program for having an apparatus that includes

2   a CPU execute file-update processing in which a plurality

3   of update procedures are executed to update a file on a first

4   recording medium storing location information showing a

5   storage location, on the first recording medium, of data

6   constituting a content of the file, the file-update

7   processing comprising the steps of:

8   recording, onto a second recording medium, progress

9   information showing which of the update procedures have been

10 executed in updating the file;

11 recording, onto the first recording medium, data

12 constituting a content of the file after updating, in a

13 different storage location from the data constituting the

14 content of the file before updating;

15 recording, onto the second recording medium, update

16 information showing the storage location, on the first

17 recording medium, of the data constituting the post-update

18 file content; and

19 updating, after the update information has been

20 recorded, the location information based on the update

21 information, so as to show the storage location of the data

22 constituting the post-update file content.